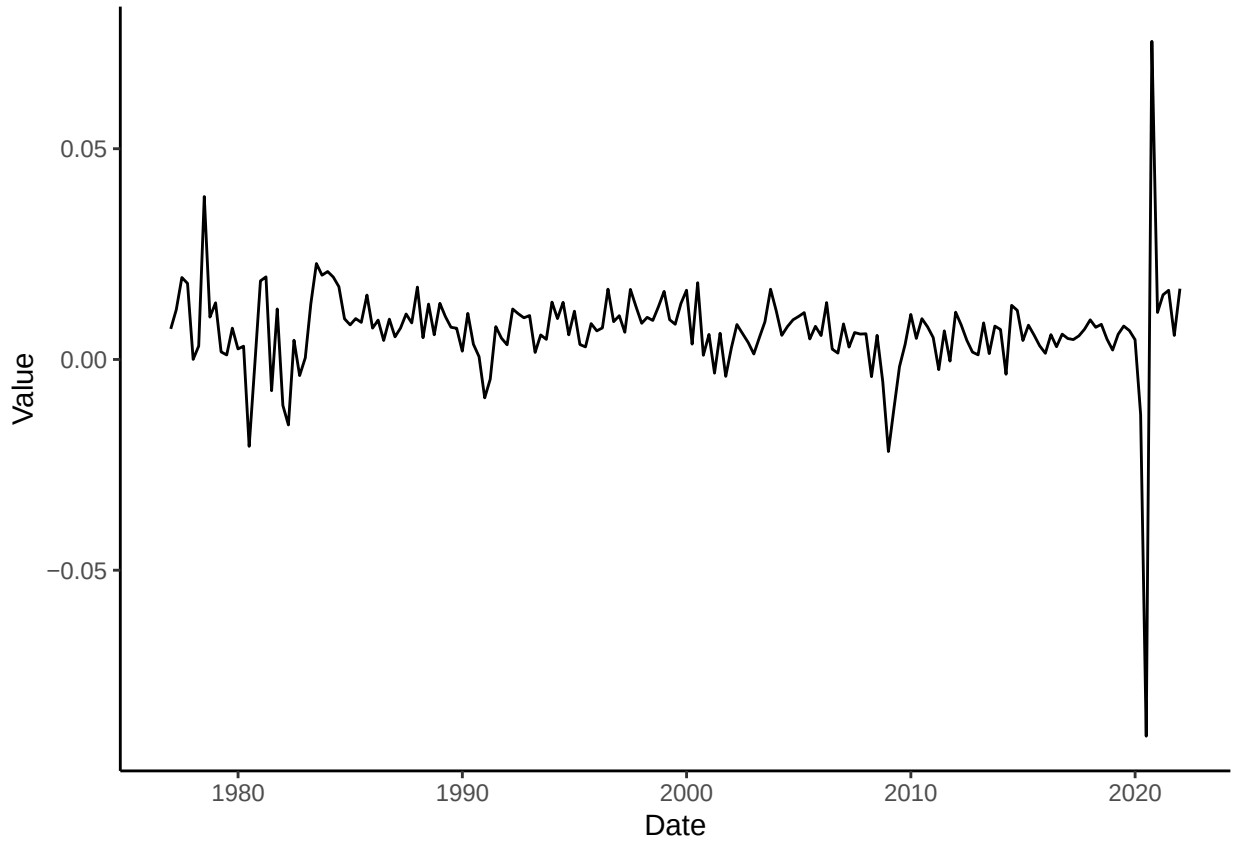
Assignment 7

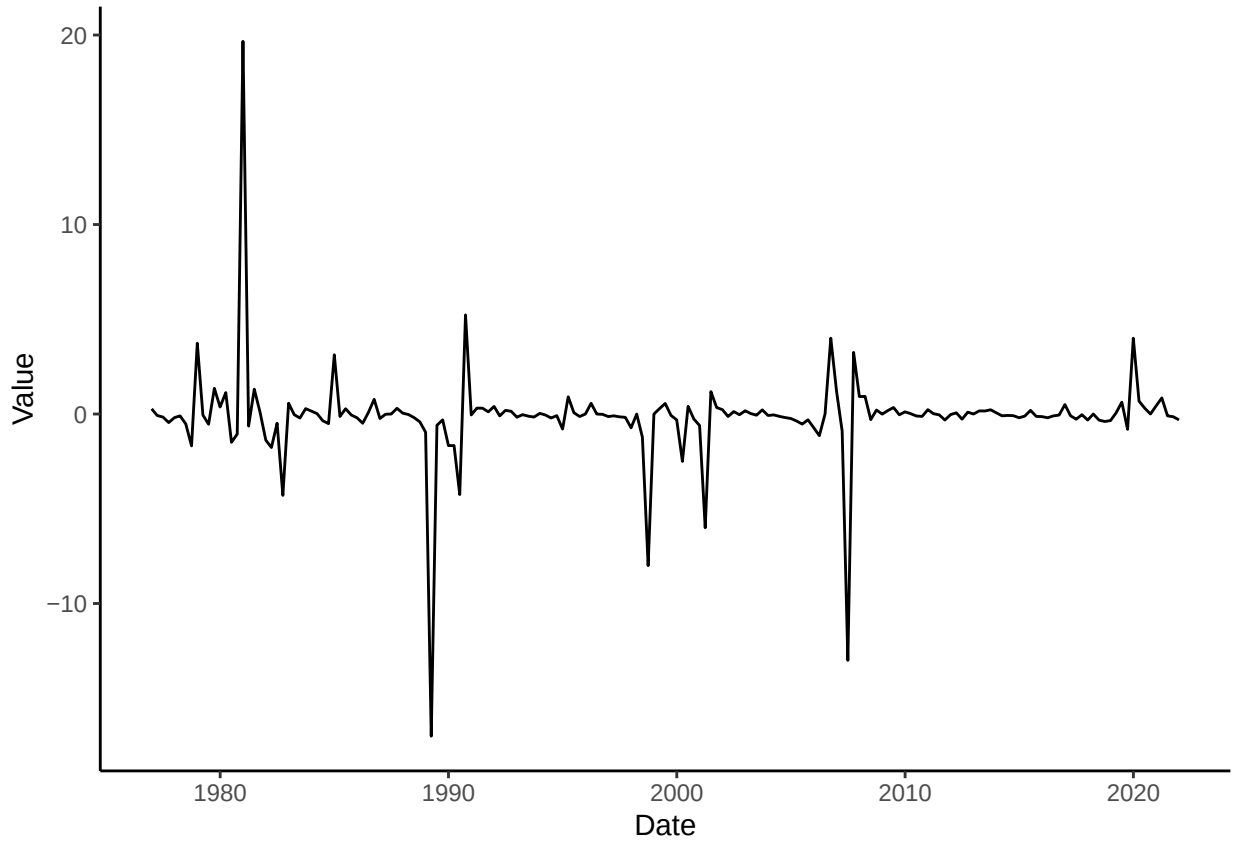
2022-03-23

First, I will insert the necessary libraries and the datasets.

```
#load libraries
library(tidyverse)
library(ggplot2)
library(quantmod)
library(Quandl)

#read in the data from fred
#first data set is the real GPD growth
#second data set loaded in will be: 10-Year Treasury Constant Maturity Minus 2-Year Treasury Constant M
Quandl.api_key("Bsjtos3Rumnys9NRFspt")
macro_data <- Quandl(c("FRED/GDPC1"), start_date="1976-06-01", end_date="2021-12-31", collapse = "quarte
macro_data1 <- Quandl(c("FRED/T10Y2YM"), start_date="1976-06-01", end_date="2022-01-01", collapse = "qua
macro_data<-data.frame(macro_data)
#delete NA rows
macro_data1<- macro_data1[-c(1,183),]

GDP1<- macro_data %>% select(
  Date, Value
)
yield<- macro_data1 %>% select(
  Date, Value
)

#plot GDP and the yield
GDP_graph<-ggplot()+
  geom_line(data = GDP1, aes(x = Date, y = Value))+
  theme_classic()

print(GDP_graph)
```




```
yield_graph<-ggplot()+
  geom_line(data = yield, aes(x = Date, y = Value))+
  theme_classic()

print(yield_graph)
```



After I have plotted the GDP and the yield curve, I can create a simple regression model and summarize the output.

```
#combine the two dataframes before analysis
macro_data$yield <- macro_data1$Value
fullmodel <- lm(Value~yield, data = macro_data)
summary(fullmodel)
```

```
##
## Call:
## lm(formula = Value ~ yield, data = macro_data)
##
## Residuals:
##       Min        1Q    Median        3Q       Max
## -0.096166 -0.003325  0.000461  0.004049  0.068736
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.0067391  0.0008585   7.850 3.67e-13 ***
## yield       0.0001770  0.0003442   0.514    0.608
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01153 on 179 degrees of freedom
## Multiple R-squared:  0.001476,   Adjusted R-squared:  -0.004102
## F-statistic: 0.2646 on 1 and 179 DF,  p-value: 0.6076
```

Now, I will examine the in-sample fit.

```
fit=ts(fullmodel$fitted.values)
fit<- data.frame(fit)
GDP1$fit <- fit
GDP1$fit<- unlist(GDP1$fit)

data_combine=cbind(GDP1$Value,fit)

plot(data_combine,main="GDP growth rate",plot.type=c("single"),xlab = "date",ylab="growth Rate",col=c("
legend("bottomright",legend=c("data","in-sample fit"),col=c("blue","red"),lty=1:2)
```